IN THE CLAIMS

1. (Previously Presented) A capacitive sensor system for controlling operation of a device, the system comprising:

a sense electrode for enabling establishment of an electric field for intercepting motion of a proximate object; and

an electronic circuit for providing a control output signal in response to a rate of change in capacitance of the sense electrode due to motion of the proximate object within the field without intermediate electronic differentiation of signals related to a change in capacitance.

2. (Previously Presented) The system according to claim 1 wherein said electronic circuit comprises:

a phase locked loop, including a voltage controlled oscillator (VCO), connected to the sense electrode, for providing an operating frequency to the sense electrode;

a fixed frequency reference oscillator for providing a fixed frequency reference;

a phase/frequency comparator for comparing a VCO frequency with the fixed reference frequency;

a phase delay circuit for changing a phase difference between the VCO frequency and the fixed reference oscillator frequency when the loop is phase locked;

a loop filter for integrating a phase error signal from the phase/frequency comparator in order to define a dynamic response of the loop; and

a phase sensitive trigger circuit for providing a control output signal in response to change in a phase difference between the fixed reference frequency and the operating frequency.

3. (Original) The system according to claim 2 wherein the phase delay circuit is operative for causing the VCO frequency to run ahead of the fixed reference frequency in order that a positive rate of change in capacitance controls operation of the device.

4. (Previously Presented) The system according to claim 2 wherein the phase delay circuit is operative for causing the VCO frequency to lag behind the fixed reference frequency in order that a negative rate of change in capacitance controls operation of the device.

5. (Previously Presented) A capacitive sensor system for controlling operation of a device in response to a rate of change in capacitance due to motion of a proximate object, the system comprising:

at least one sense electrode for enabling establishment of an electric field, said electric field extending outwardly from the sense electrode;

a phase locked loop, including a voltage controlled oscillator (VCO), connected to the sense electrode, for providing an operating frequency to the sense electrode;

a fixed frequency reference oscillator for providing a fixed frequency reference;

a phase/frequency comparator for comparing a VCO frequency with the fixed reference frequency;

a phase delay circuit for causing a phase difference between the VCO frequency and the fixed reference oscillator frequency when the loop is phase locked;

a loop filter for integrating a phase error signal from the phase/frequency comparator in order to define a dynamic response of the loop; and

a phase sensitive trigger circuit for providing a control output signal in response to change in a phase difference between the fixed reference frequency and the operating frequency.

6. (Previously Presented) The system according to claim 5 wherein the phase delay circuit is operative for causing the VCO frequency to run ahead of the fixed reference frequency in order that a positive rate of change in capacitance controls operation of the device.

7. (Original) The system according to claim 5 wherein the phase delay circuit is operative for causing the VCO frequency to lag behind the fixed reference frequency in order that a negative rate of change in capacitance controls operation of the device.

8. (Previously Presented) The system according to any one of claims 5, 6, or 7 wherein the voltage controlled oscillator provides an operating frequency to the sense electrode sufficiently high to ensure the object is detected by the sense electrode as a dielectric material.

9. (Original) The system according to claim 8 wherein the voltage controlled oscillator provides an

operating frequency of less than about 1 MHz for operating a soap dispenser by motion of a human hand.

10. (Original) The system according to claim 8 wherein the voltage controlled oscillator provides an operating frequency greater than about 10 MHz for operating a faucet by motion of a human hand.

11. (Currently Presented) The system according to claim 5 wherein the electrode is planar.

12. (Previously Presented) The system according to claim 11 further comprising a grounded shield electrode disposed in a spaced apart and surrounding relationship with the sense electrode, the shield electrode being in a plane generally perpendicular with the sensor electrode and extending away from the established electric field.

13. (Previously Presented) The system according to claim 11 further comprising a grounded shield electrode disposed in a plane generally parallel to the sense electrode.

14. (Original) The system according to claim 5 wherein said trigger circuit comprises a D-Flop circuit.

15. (Currently Presented) A capacitive sensor system for controlling operation of a device in response to a rate of change in capacitance due to motion of a proximate object, the system comprising:

at least one sense electrode for enabling establishment of an electric field, said electric field extending outwardly from the sense electrode;

a phase locked loop, including a voltage controlled oscillator (VCO), connected to the sense electrode, for providing an operating frequency to the sense electrode;

a fixed frequency reference oscillator for providing a fixed frequency reference;

a loop filter for integrating a phase error signal from a phase/frequency comparator in order to define a dynamic response of the loop; and

a phase sensitive trigger circuit for providing a control output signal in response to a change in a phase difference between the fixed reference frequency and the operation frequency, the trigger circuit including a voltage comparator, having one side connected to the VCO, and a long time constant loop filter connected between the phase/frequency comparator and the voltage comparator.

16. (Currently Amended) A capacitive sensor system for controlling operation of a device in response to a rate of change in capacitance due to motion of a proximate object, the system comprising:

at least one sense electrode for enabling the establishment of an electric field;

a phase locked loop, including a voltage controlled oscillator (VCO), connected to the sense electrode, for providing an operating frequency to the sense electrode;

a fixed frequency reference oscillator for providing a fixed frequency reference;

a ~~phase frequency/comparator~~phase/frequency comparator for comparing a VCO frequency with the fixed reference frequency;

a phase delay circuit connected between said phase/frequency comparator and said voltage controlled oscillator for causing said voltage controlled oscillator to run ahead of the reference oscillator; and

a trigger circuit for providing a control output in response to a change in phase shift between said fixed frequency and said operating frequency.

17. (Currently Presented) The system according to claim 16 wherein voltage controlled oscillator provides an operating frequency to the sense electrode sufficiently high to ensure the object is detected by the sense electrode as a dielectric material.

18. (Original) The system according to claim 17 wherein the voltage controlled oscillator provides an operating frequency of less than about 1 MHz for operating a soap dispenser by motion of a human hand.

19. (Original) The system according to claim 17 wherein the voltage controlled oscillator provides an operating frequency greater than about 10 MHz for operating a faucet by motion of a human hand.

20. (Previously Presented) The system according to claim 19 further comprising a shield electrode disposed in a spaced apart and surrounding relationship with the sense electrode.

21. (Original) The system according to claim 16 wherein said trigger circuit comprises a D-Flop circuit.

22. (Previously Presented) The system according to claim 5, 15 or 16 further comprising an adaptive feedback path connected between the phase/frequency comparator and the VCO for maintaining a phase difference between the fixed reference frequency and the VCO operating frequency between +90 and -90 degrees.

23. (Original) The system according to claim 5, 15 or 16 further comprising an RF attenuating filter interconnected between the sense electrode and the VCO.

24. (Previously Presented) The system according to claim 5, 15 or 16 further comprising a frequency divider interconnecting the VCO and the phase/frequency comparator.